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Torque-Hub® Planetary Final Drive
W6 Series Service Manual

Rev. 1/21/13

Introduction

This service manual is a step-by-step guide designed for the customer or shop mechanic who is servicing or repairing a particular model of Torque-Hub® Final Drive. (The model covered by this copy of the manual is specified on the cover page.)

Included are —

1. assembly and exploded view drawings
2. disassembly procedure
3. main assembly procedure (assuming all sub-assemblies to be intact)
4. sub-assembly procedures

At the time of printing, this manual was complete for the specific Torque-Hub® model designated. However, Fairfield Manufacturing Co. Inc. reserves the right to update and improve its products at any time. All specifications and procedures are therefore subject to change without notice.

Safety

Standard safety practices should be followed during the disassembly and assembly procedures described. Safety glasses and safety shoes should be worn; and heavy, heat resistant gloves should be used when heated components are handled. Be especially alert when you see a caution symbol like the one above. This symbol indicates that a particular operation could cause personal injury if not performed properly or if certain safety procedures are not followed.

While every precaution has been taken in the preparation of this document, Fairfield Manufacturing Co. Inc. assumes no liability with respect to the use of the documentation described herein, or for any act or omission of Fairfield Manufacturing Co. Inc. concerning this documentation. Torque-Hub® is a registered trademark of Fairfield Manufacturing Co. Inc.

Disassembly Procedure

1. Loosen all 12 Bolts (17 & 18) and drain the oil from the unit.

2. Remove the 12 Bolts (17 & 18) and remove output carrier sub-assembly (4A-5).

3. Remove and discard O-ring (5) from counterbore of spacer ring (22).

4. Remove Spacer Ring (22).

5. Lift out 2nd stage sun gear (6). Disconnect. Spacer (4Q) will remain in sun gear (6).

6. Remove thrust washer (15) from end of input shaft (11).

7. Lift out input carrier sub-assembly (3A-F).

8. Remove input shaft/gear (11 & 13) or (13).

9. Remove thrust washer (12) from end of spindle (1A).

10. Remove internal gear (2).

11. Remove retaining ring (11) from groove in spindle (1A).

    Eye protection should be worn during this procedure.

12. Remove bearing spacer (1H) from spindle (1A) and bearing cone (1F).

13. Hub (1G) may now be removed from spindle (1A). On some models, Bearing Cone (1F) is press fit and Spindle (1A) must be pressed from Hub (1G). Seal (1B), bearing cups(1C & 1E) and cones (1D & 1F) will remain in hub (1G).

14. Seal (1B) can be removed and is to be discarded. Bearing Cones (1D & 1F) may be removed.

15. If bearings are to be replaced/cups (1C & 1E) can be tapped out of hub (1G) using a hammer and punch.

16. By removing retaining ring (9), engage spring (8) and spacer washers (7) may be disassembled from spindle (1A).

    Eye protection should be worn during this procedure.

17. Retaining ring (10) on input gear/shaft (11/13) should be inspected and replaced if necessary.

    Eye protection should be worn during this procedure.

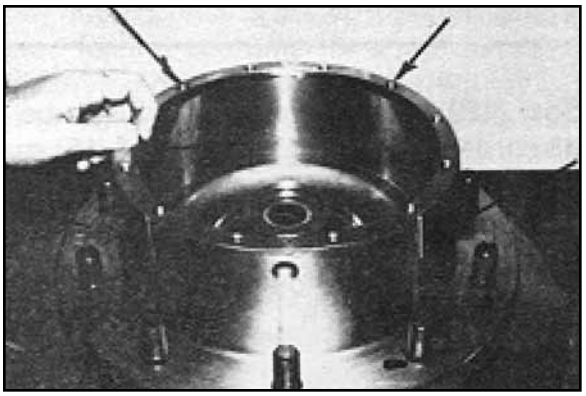
18. If coupling (19) was not previously removed, it may now be removed from the motor mounting side of spindle (1A).

19. If this unit has a blocked coupling, the anti-disconnect spacer (22) may be removed from coupling (19A) by removing retaining rings (20). Inspect retaining ring (21) and replace if necessary.

    Eye protection should be worn during this procedure.

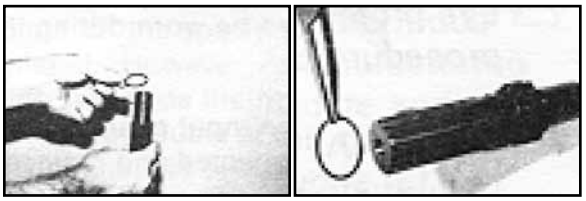
20. The carrier sub-assemblies can be disassembled by tapping roll pins (3D & 4G) into planet shafts (3E & 4E). Remove the planet shafts (3E & 4E) from carriers (3A & 4A). Roll pins (3D & 4G) should be tapped out of planet pins (3E & 4E) at this time. Planet gears (3F & 4F), thrust washers (3B & 4B), and needle rollers (3C & 4C) can now be removed from carriers (3A & 4A).

Main Assembly Procedure



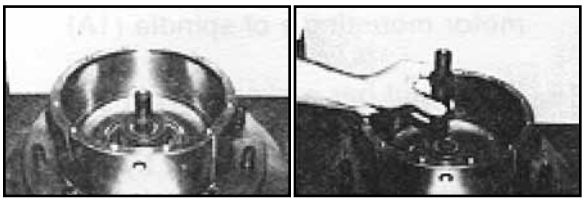
1. With hub spindle sub-assembly (1A-1N) resting on the spindle (1A) install O-ring (5) into the counterbore of hub (1G). Use sufficient grease or petroleum jelly to hold O-ring (5) in place. Slight stretching of O-ring (5) may be necessary to acquire fit. Also, locate and mark 4-counter reamed hole in the face of hub (1G).

   Beware of sharp edges of the counterbore while seating O-ring (5).

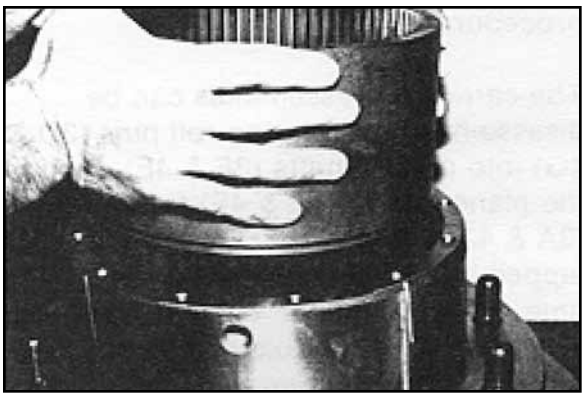


2. Some models will have a two-piece input gear (13) and input shaft (11) while others will have a one-piece shaft/input gear (13). Install retaining ring (10) into groove on input shaft (11) or shaft/input gear (13).

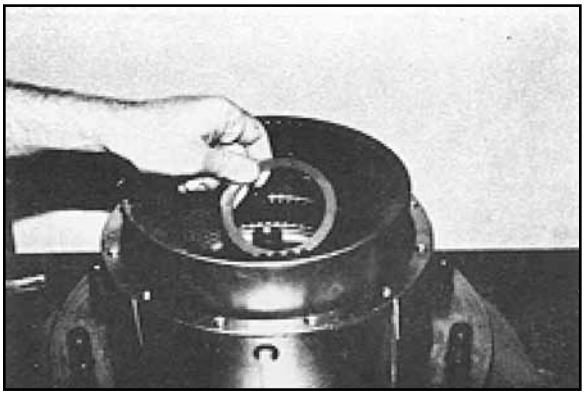
   Eye protection is to be worn during this operation.



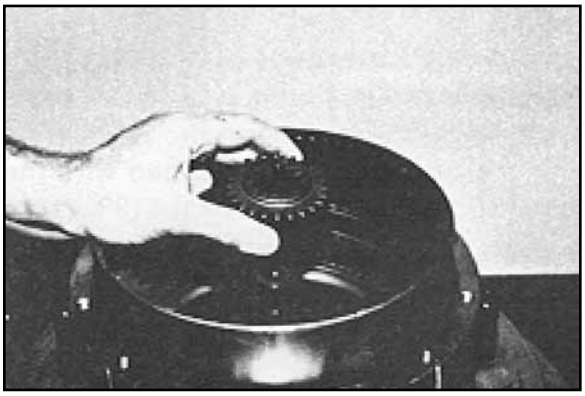
3. Install input shaft (11) or shaft/input gear (13) into bore of spindle (1A). Full length spline end into the spindle (1A) bore. Retaining ring (10) will rest on engagement spring spacer (7) and the spring action should be tested at this time.



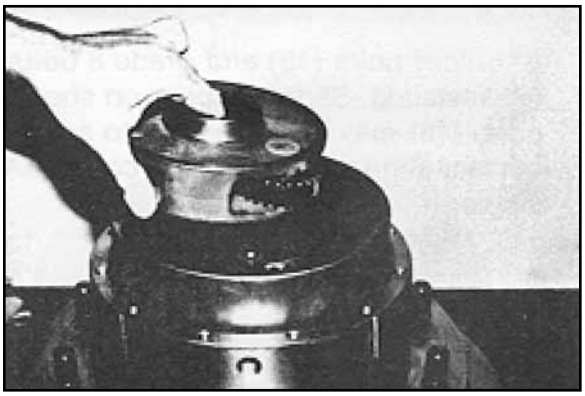
4. Internal gear (2) is installed into hub (1G) and mating the spline of spindle (1A).



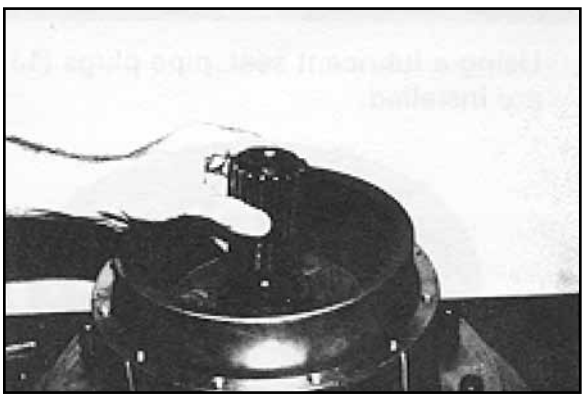
5. Thrust washer (12) is installed into that portion of spindle (1A) which extends through internal gear (2). (When rebuilding a unit mounted horizontal, sufficient grease or petroleum jelly should be used to hold thrust washers (12) in place.



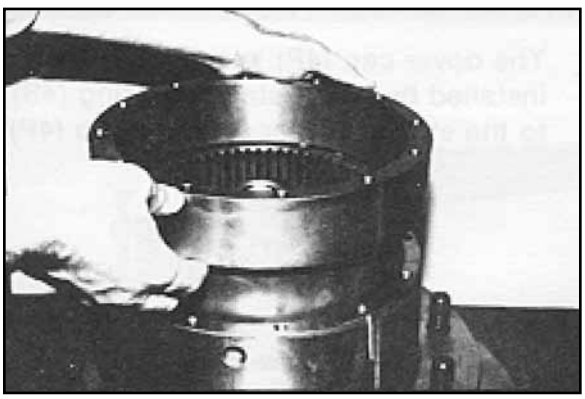
6. If this model has two-piece input, input gear (13) is installed onto input shaft (11) spline bore meshing with splined outer diameter of input shaft (11). Care should be taken to install input gear (13) with the longer step shoulder down onto the inside of internal gear (2). Units with one-piece input does not require this assembly.



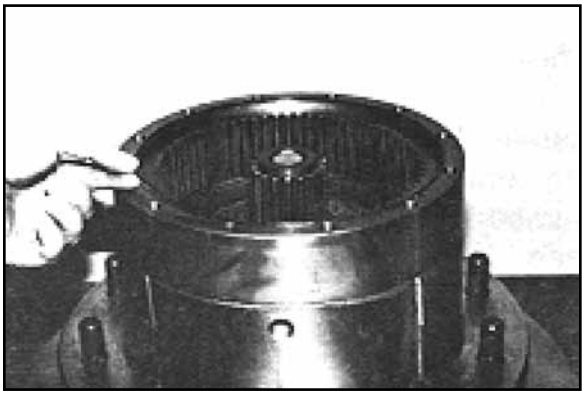
7. Input carrier assembly (3A-3F) is installed into internal gear (2). The teeth of planet gear (3F) will mesh with the teeth of the Internal Gear (2) and Input Gear (13) simultaneously; therefore slight rotation may be necessary. Care should be taken to ensure the carrier is installed with the shoulder side up.



8. The 2nd stage sun gear (6) is installed into input carrier (3A). The reduced diameter spline is in stalled into the spline bore of the carrier (3A).

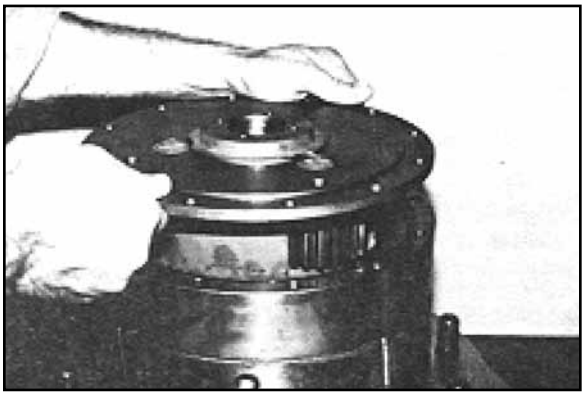


9. After checking to ensure that O-ring (5) is still correctly positioned, spacer ring (22) is installed on hub (1G), shoulder side down, or into hub (1G). Care should be taken to align the one hole in spacer ring (22) identified with an “X” (on the shoulder side) with any one of the four holes marked in step 1. Two of the four shoulder bolts (18) may be used 180° apart to assist in alignment counter reamed holes.

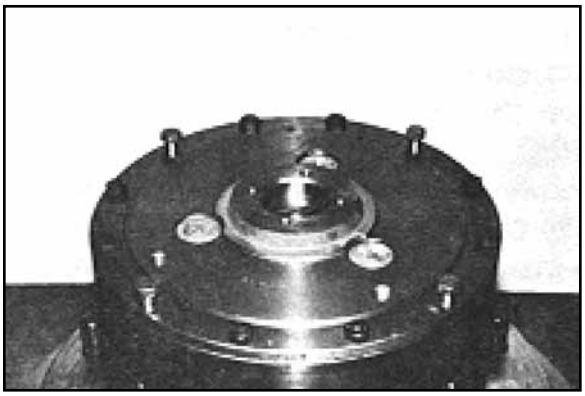


10. The remaining O-ring (5) is installed into the counterbore of spacer ring (22). Slight stretching of O-ring (5) may be necessary to acquire fit.

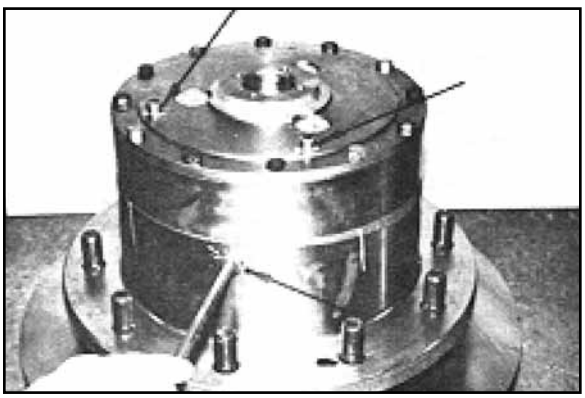
Beware of sharp edges of the counterbore while seating O-ring (5).



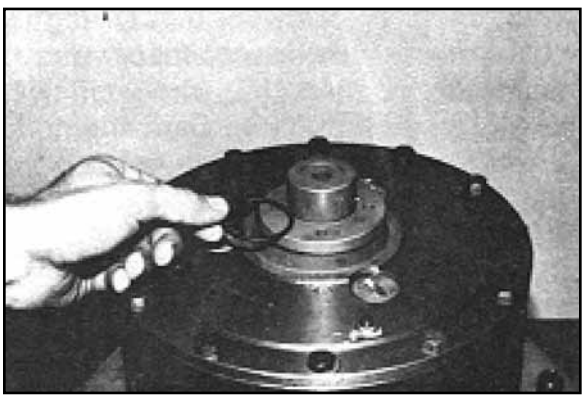
11. The output carrier/cover sub-assembly (4A-4S) is installed after identifying the 4 holes marked with an “X” (on the under side). These holes are to be aligned with the marked holes in spacer ring (22) and hub (1G). Planet gears (4F) will mesh with internal gear (2) and 2nd stage sun gear (6) simultaneously, therefore slight rotation may be necessary.



12. Shoulder bolts (18) and grade 8 bolts (17) are installed. Slight tapping on shoulder bolts (18) may be necessary to acquire correct alignment of carrier/cover (4A), spacer ring (22) and hub (1G).

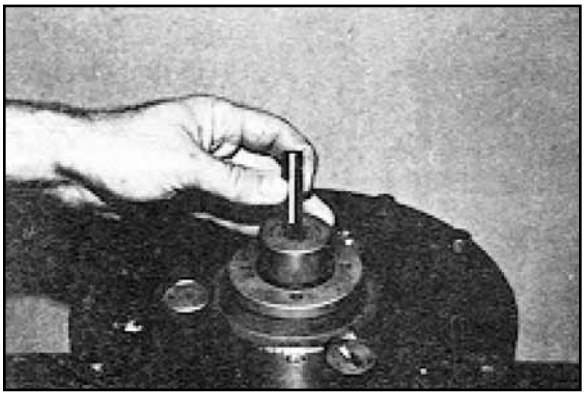


13. Using a lubricant seal, pipe plugs (1J & 4I) are installed.

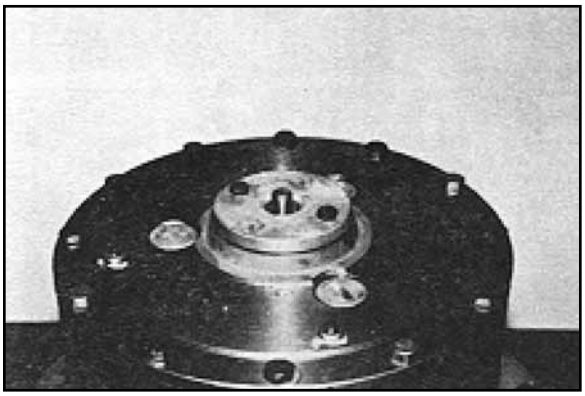


14. The cover cap (4P) is assembled and installed by first installing O-ring (4S) on to the step shoulder of cover cap (4P).

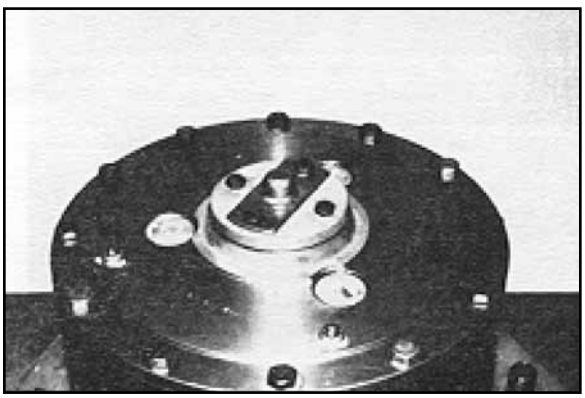
15. O-ring (4R) is now installed into the bore of cover cap (4P).



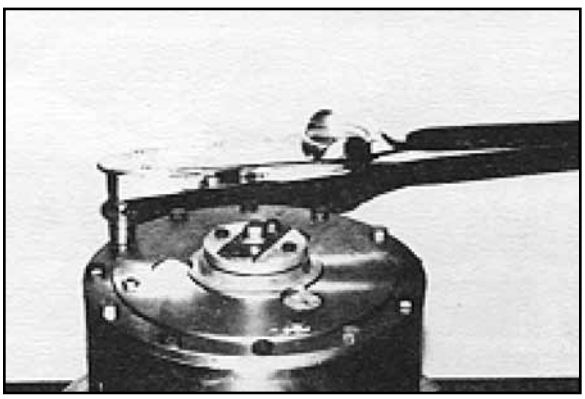
16. Disconnect rod (4N) may be utilized to position O-ring (4R) into O-ring groove of the bore of cover cap (4P). Disconnect rod (4N) will then remain in the bore of cover cap (4P) being held in place by O-ring (4R).



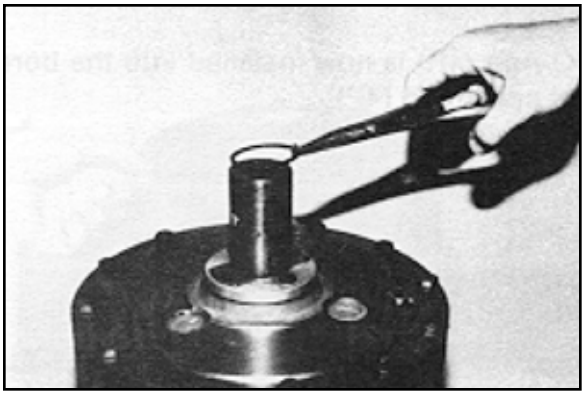
17. Cover cap (4S) is installed into the bore of carrier/cover (4A) and 2 of the 4 bolts (4M) are installed 180° apart and torqued to 70-80 in.-lbs.



18. Disconnect cap (4L) is installed onto cover cap (4S) utilizing the remaining 2 holes. These bolts (4M) are also torqued to 70-80 in.-lbs.

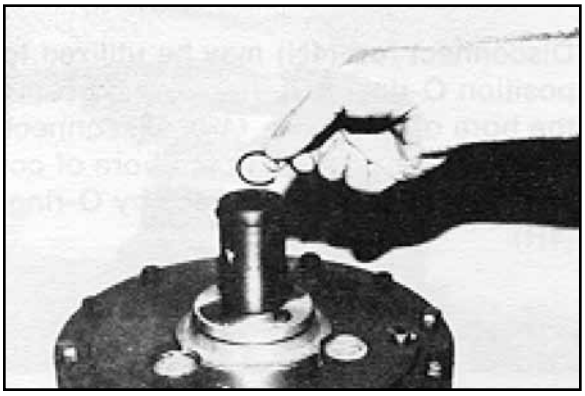


19. Shoulder bolts (18) and remaining 8 grade 8 bolts (17) are torqued to 47 ft-lbs. Shoulder bolts (18) should be torqued last.



20. Coupling (19) is assembled by first installing retaining ring (21) into remaining ring groove in outer diameter of coupling (19).

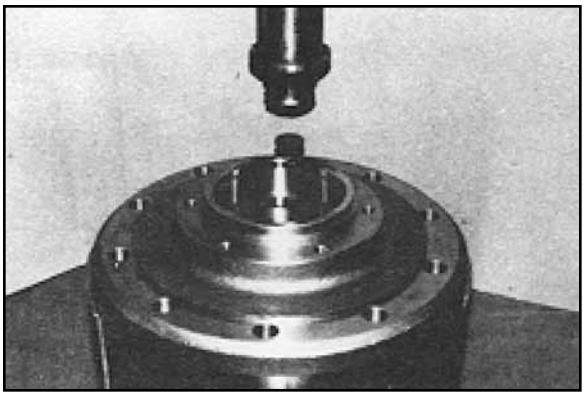
Eye protection is to be worn during this operation.



21. Retaining ring (20) is installed into the bore of coupling (19). Care should be taken to ensure retaining ring (20) is correctly seated in the groove. If unit has blocked coupling feature, anti-disconnect spacer (22) and remaining retaining ring (20) may be installed at this time. Install coupling (19) in spindle (1A).

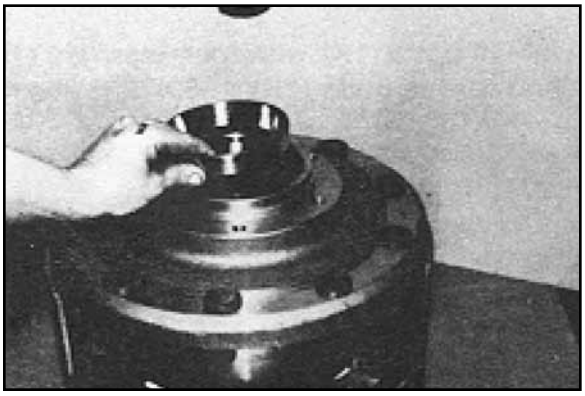
Eye protection is to be worn during this operation.

Hub Spindle Sub-Assembly Procedure

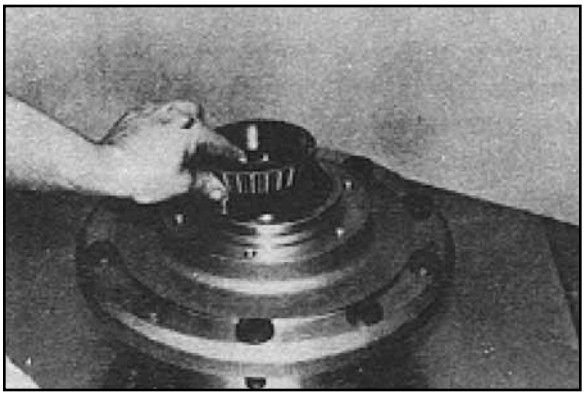


1. Using an arbor type press if available (if not, a hammer may be used), install the wheel studs (1N). The hub flange should be supported from the underside during this operation.

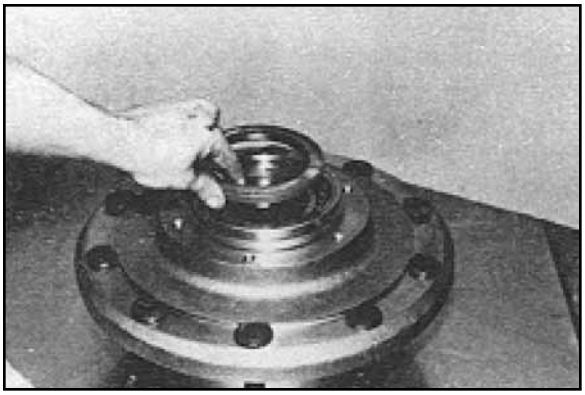
   Note: Wheel studs are optional.



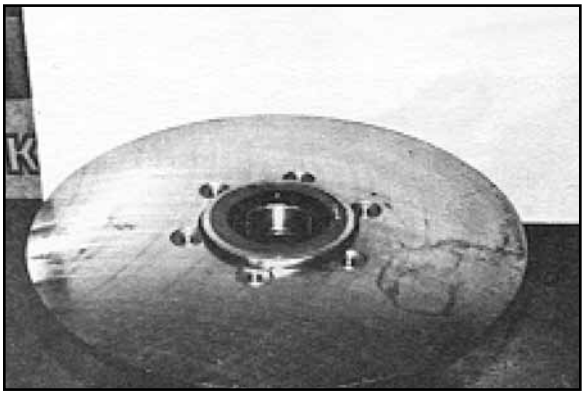
2. Using an arbor type press if available, press bearing cup (1C) into hub (1G) counterbores. Cup #JM716610 (1C) will go into small end of hub (1G), and cup #JM515610 will go into large end of hub (1G).



3. Place bearing cone #JM716649 (1D) into bearing cup (1C) in small end of hub (1G).

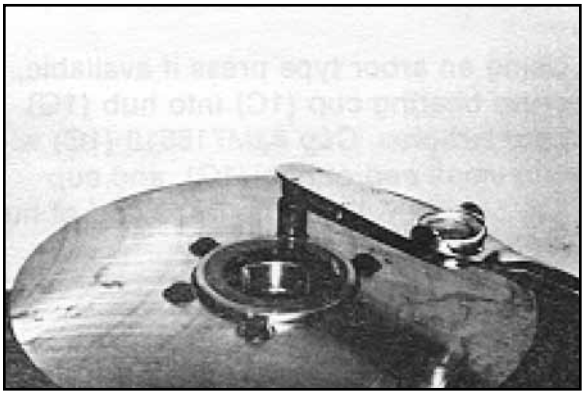


4. Press seal (1B) into hub (1G) counterbore with flat metal side facing in. Use a flat object to assure that seal (1B) is pressed evenly and is flush with hub face.

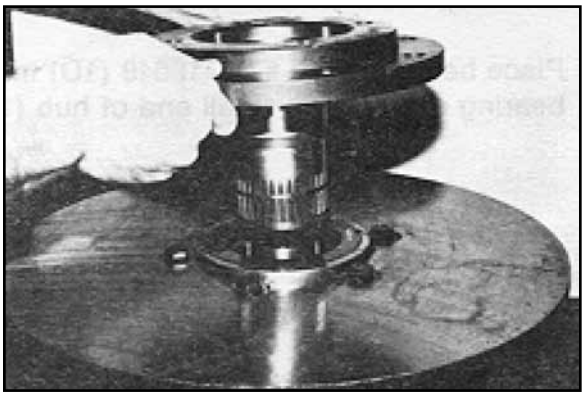


5. Should this application require the optional disc (1M), it is installed onto the small diameter end of hub (1G), spot faced holes up and aligned with tapped holes in hub (1G).

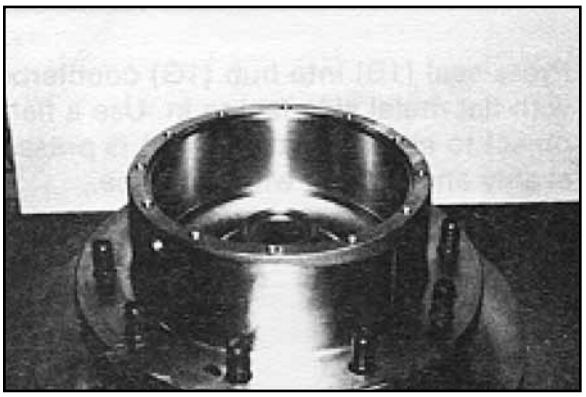
6. Using loctite 271, apply a coat to each of the 6 grade 5 bolts (1K).



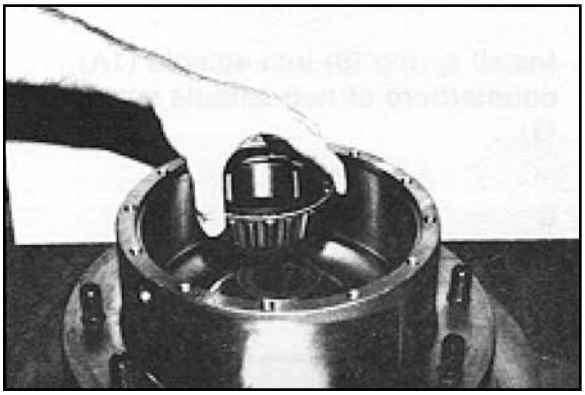
7. Install bolts (1K) with lock-washers (1L) and torque bolts (1K) to 55-75 ft.-lbs.



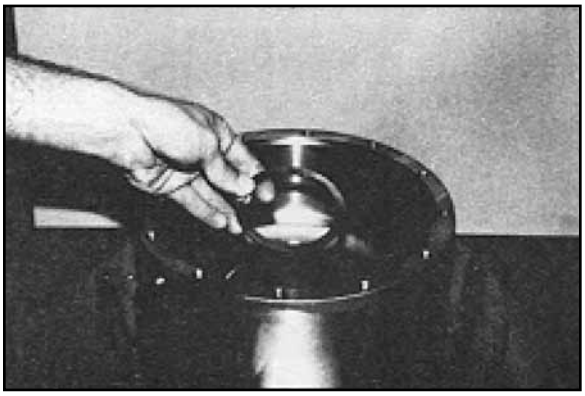
8. After applying a generous coat of assembly oil (EP-90) to the seal (1B) and bearing cone (1D) carefully lower spindle (1A) into hub (1G).



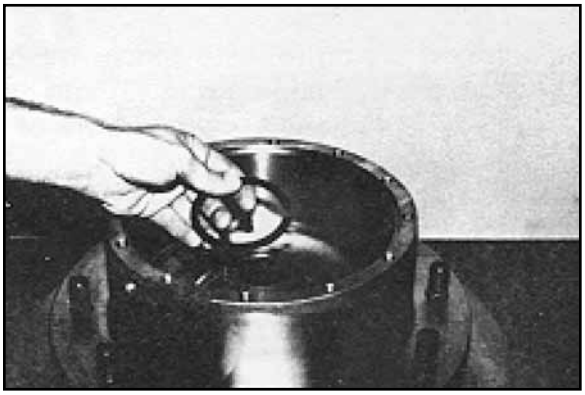
9. While inverting this assembly, care should be taken not to allow spindle (1A) to fall out or damage seal (1B). If a hoist is available, the hub (1G) could be lowered onto spindle (1A).



10. Place bearing cone #JM515649 (1F) over end of spindle (1A) and into bearing cup (1E).

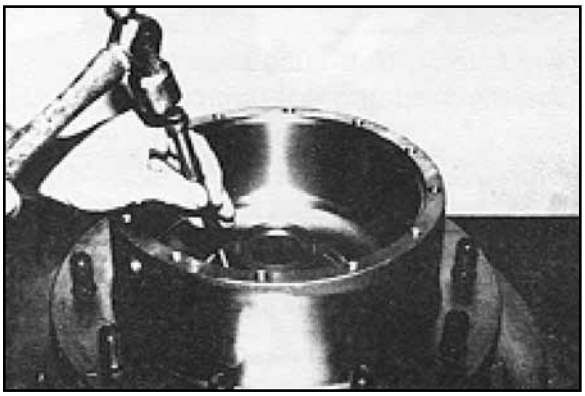


11. Place bearing spacer (1H) over end of spindle (1A) and against bearing cone (1F).



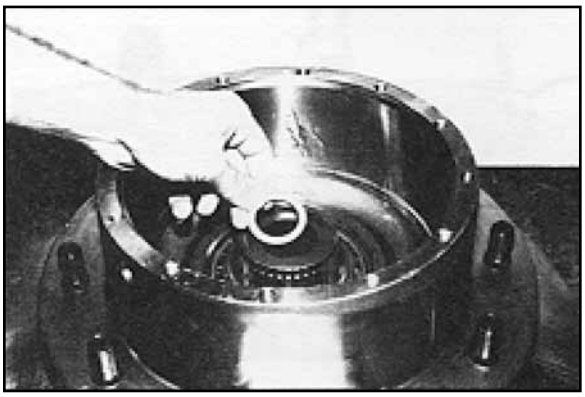
12. Secure retaining ring (1I) completely into spindle groove and against bearing spacer (1H).

Eye protection is to be worn during this operation.

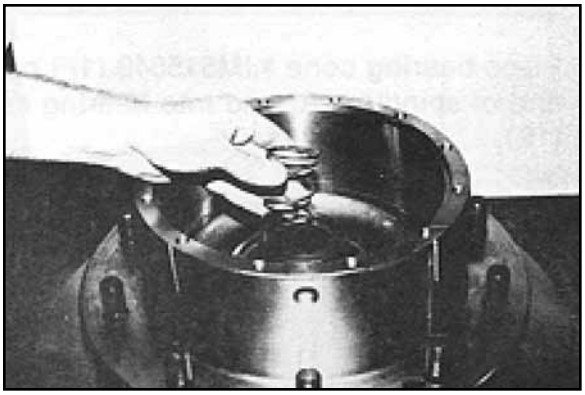


13. A soft punch and hammer may be used to ensure that retaining ring (1I) is completely seated into the retaining ring groove of spindle (1A).

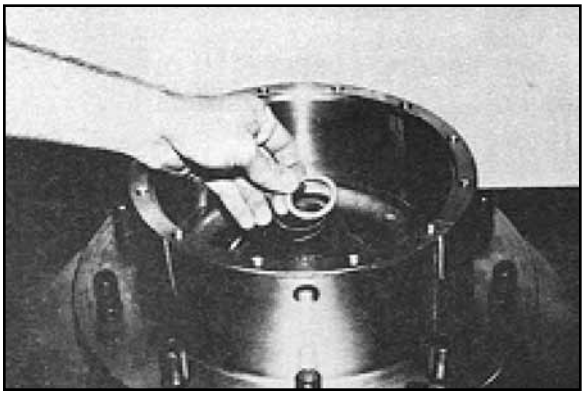
Eye protection is to be worn during this operation.



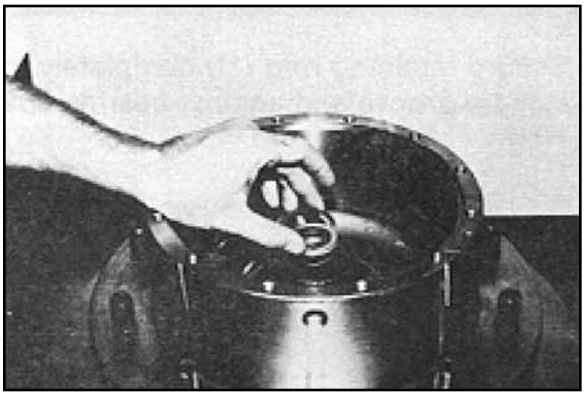
14. Install spacer washer (7) into spindle (1A) counterbore of hub-spindle sub-assembly.



15. Install spring (8) into spindle (1A) counterbore of hub-spindle sub-assembly (1).



16. Set spacer washer (7) on spring (8) in spindle (1A) counterbore of hub-spindle sub-assembly (1).

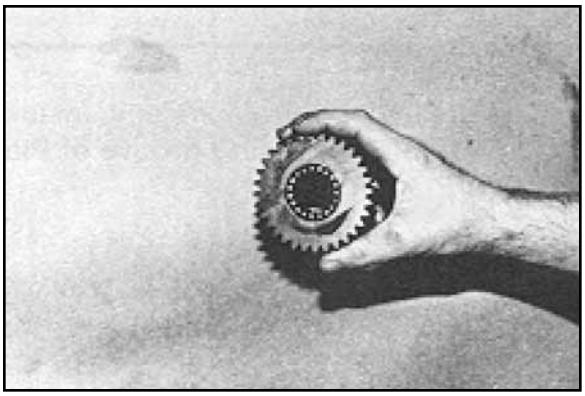


17. Compress spring (8) with spacer washer (7) and install retaining ring (9) into groove in spindle (1A) counterbore of hub-spindle sub-assembly (1).

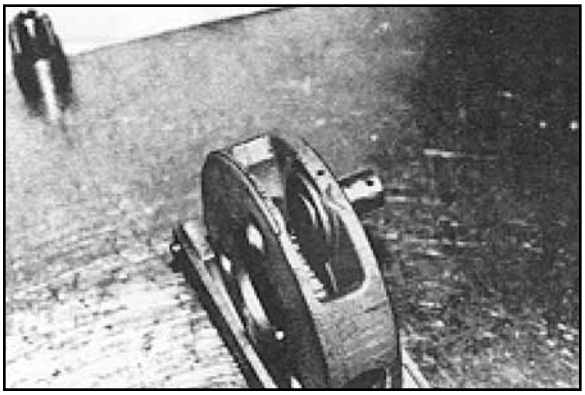
Eye protection is to be worn during this operation.

This completes the hub-spindle sub-assembly. If it is not going to be used immediately, it should be oiled and covered to help prevent rust and contamination.

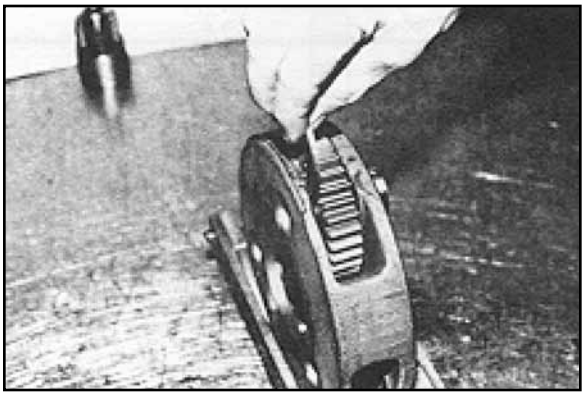
Carrier Sub-Assembly Procedure



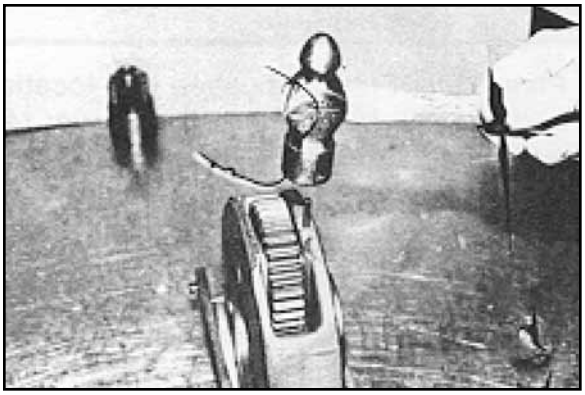
1. Starting with the Planet Gears (3F) and using sufficient grease or petroleum jelly to hold in place, install 19 Needle Rollers (3C) in each.



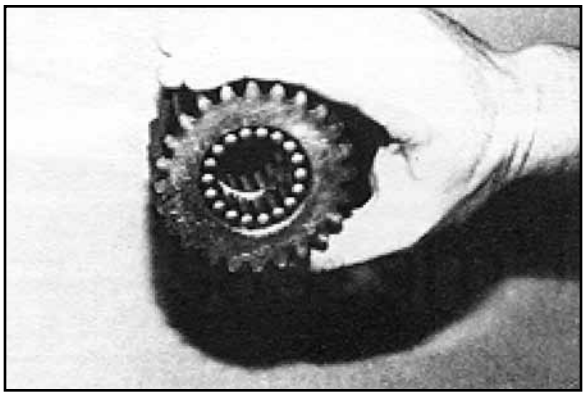
2. With Carrier (3A) standing on edge, start Planet Pins (3E) through the Planet Pin holes in Carrier (3A). Using sufficient grease or petroleum jelly to hold together and in place, install 2 Thrust Washers (3B) on the end of Planet Pin (3E).



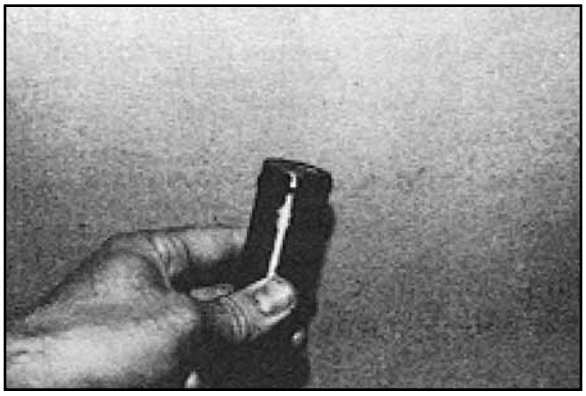
3. The Planet Gears (3F) are positioned and Planet Pins (3E) are pushed through as 2 additional Thrust Washers (3B) are inserted. Once again, sufficient grease or petroleum jelly should be used to hold Thrust Washers (3B) together and in place.



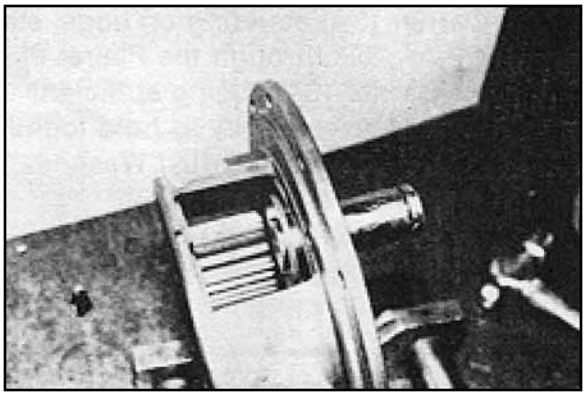
4. Planet Pins (3E) are pushed into location and the Roll Pin holes in the Carrier (3A) and Planet Pin (3E) are aligned. The Planet Pin (3E) Roll Pin hole is chamfered on one end only. This chamfer should be positioned at the top to allow easy installation of Roll Pin (3D) in cases of slight misalignment of the Roll Pin holes. Roll Pin (3D) is tapped into position flush with Carrier (3A) surface.



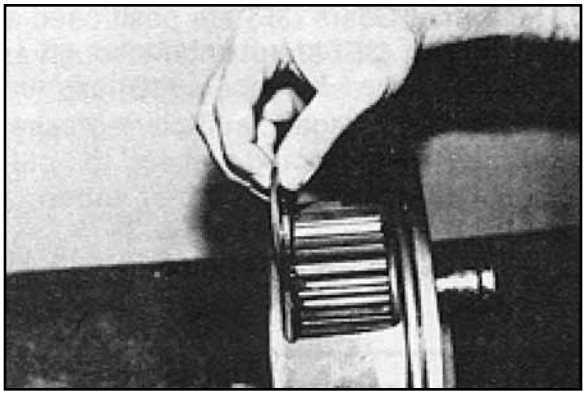
5. Starting with the Planet Gears (4F) and using sufficient grease or petroleum jelly to hold in place, install 18 Needle Rollers (4C) in each half of Planet Gears (4F) with Spacers (4D) in between them.



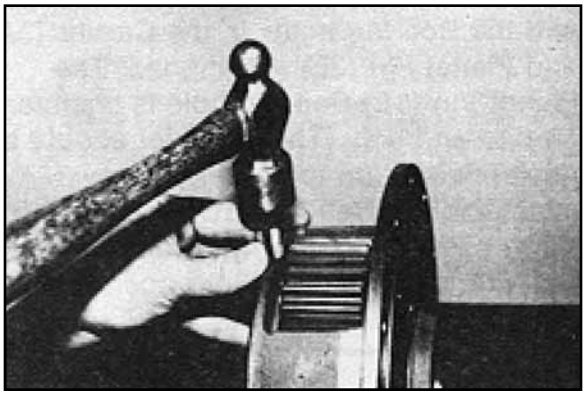
6. Using grease or petroleum jelly, install O-ring (4H) into the O-ring groove of Planet Shaft (4E).



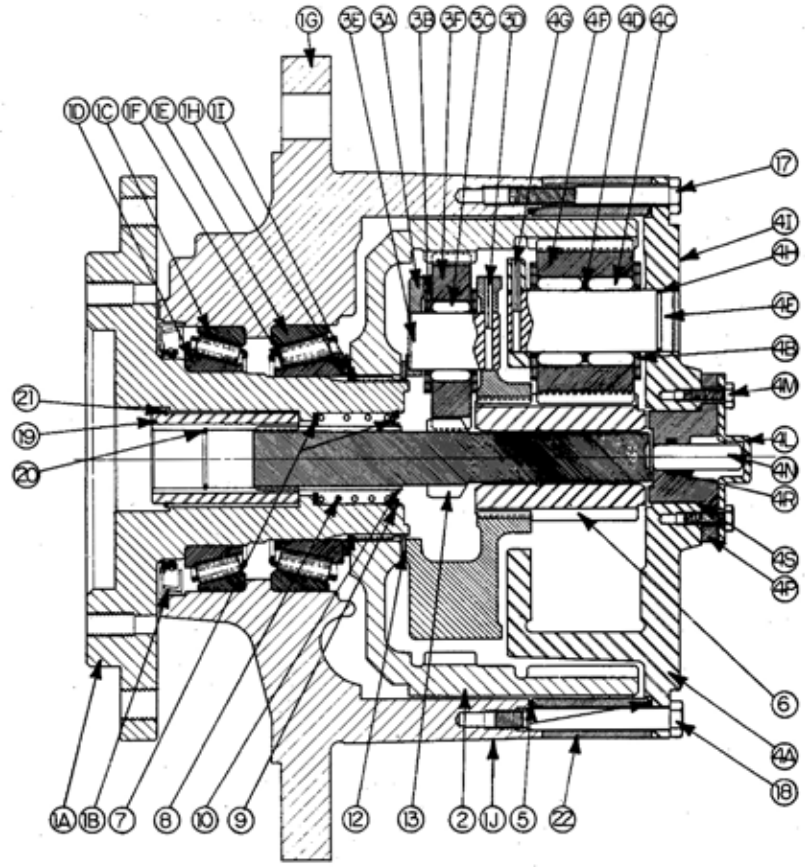
7. With Carrier/Cover (4A) standing on edge, start Planet Shaft (4E) through the Planet Shaft holes in Carrier/Cover (4A). Using sufficient grease or petroleum jelly to hold together and in place, install 2 Thrust Washers (4B) on the end of Planet Shaft (4E).



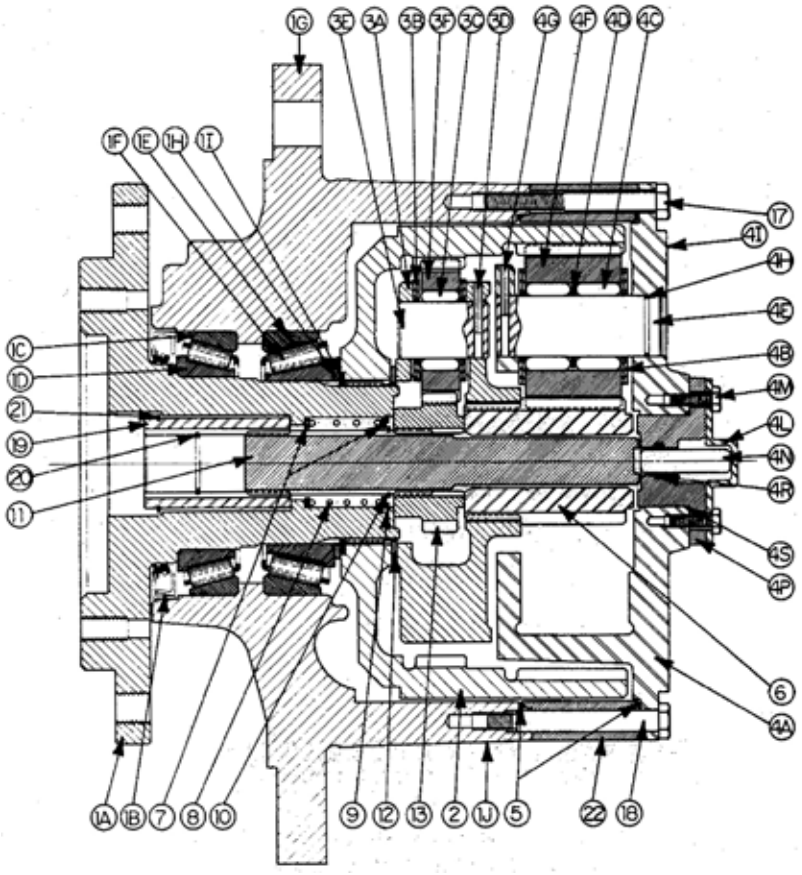
8. The Planet Gears (4F) are positioned and Planet Shaft (4E) are pushed through as 2 additional Thrust Washers (4B) are inserted. Once again sufficient grease or petroleum jelly should be used to hold Thrust Washers (4B) together and in place.



9. Planet Shaft (4E) is pushed into location and the Roll Pin holes in the Carrier (4A) and Planet Shaft (4E) are aligned. The Planet Shaft (4E) Roll Pin hole is chamfered on one end only. This chamfer should be positioned at the top to allow easy installation of Roll Pin (4G) in cases of slight misalignment of the Roll Pin holes (4G) are tapped into position flush with Carrier (4A) surface.



W6 with one-piece input shaft/input gear (13)



W6 with two-piece input shaft (11) and input gear (13)

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